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# Gadgets and Grieving: A Chronological Analysis on the Ways in Which Advancements in Medical Technologies Have Altered the Grieving Process

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Gadgets and Grieving: A Chronological Analysis on the Ways in Which  
Advancements in Medical Technologies Have Altered the Grieving Process

An Honors College Project Thesis

Presented to

The Department of Biology

Abilene Christian University

In Partial Fulfillment

of the Requirements for

Honors Scholar

by

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This Project Thesis, directed and approved by the candidate's committee,  
has been accepted by the Honors College of Abilene Christian University  
in partial fulfillment of the requirements for the distinction

HONORS SCHOLAR

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**Abstract**

Since the 1940s, both end-of-life care and advancements in medical technologies have expanded exponentially. This article explores the advancements in medical technologies and how it has altered the way that Western society grieves death. With the capabilities to prolong life, the family, the patient, and the medical team, all grieve the end of life in different ways. This article provides a chronological analysis of palliative care, hospice care, and various medical advancements. These changes in medicine are then paralleled with alterations in the bereavement process. Clinicians who have observed transitions in medical technologies were interviewed, and their experiences with the various technological transitions as well as alterations in bereavement were analyzed. This article explores historical and anecdotal narratives of Western society's transformation of grief through the lens of medical advancements.

*Keywords:* bereavement, medicine, advancements

### Overview

Death is an unavoidable certainty of life. It is also one of the most universal and unifying characteristics of life. One will experience the death of loved ones and eventually death will capture oneself as well. As one observes death or as one goes through the process of dying, various stages of bereavement will occur. Within the literature, *bereavement* is defined as a multifaceted response of grief to the loss of someone or something that the individual had deep connection with. *Dying* is defined as the process by which one's life ends whereas *death* is the moment at which life ceases. The very definition of death has generated significant debate within today's medical community. The process of dying has undergone extensive change and transition throughout recent history. Before the 20th century, death was generally attributed to infection, poor hygiene, disease, violence, epidemics, and other various crises. The dying process was short-lived or instantaneous due to a lack of medical advancements and technologies.<sup>1</sup> The young were incredibly susceptible and would often be the first within a family to die. In the late 19th century, one in every four children would die before the age of five.<sup>2</sup> In recent history, death has become a more prolonged process that occurs a majority of the time in older adults.<sup>3</sup> The number of individuals in the United States that are over 65 has been increasing at such an astonishing rate with a record 46 million in 2014, and that number is only expected to increase.<sup>4</sup> Dying has transitioned from a short-lived experience, like infection, to a prolonged death, usually due to chronic illnesses.<sup>5</sup>

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<sup>1</sup> Mitford, 1963; Aries 1981

<sup>2</sup> Secretary of the Interior, 1860

<sup>3</sup> Federal Interagency Forum on Aging Related Statistics, 2016

<sup>4</sup> *ibid.*

<sup>5</sup> Kochanek, Murphy, Xu & Tejada-Vera, 2016

Medical practitioners within the United States are able to better anticipate the timing of death given that chronic illnesses have highly expected outcomes.<sup>6</sup>

Death has transitioned from a reality of life to an anomaly within more recent years. This transition from normalcy to abnormality has had large implications on the way that one grieves death. The grieving of death has started to occur months and, at times, years before the person has passed. A well-learned nurse and physician could generally look at a patient with a chronic illness, observe their vitals, and give a fairly accurate timeframe for life. When the temporal nature of life is recognized, death gains its footing and oftentimes grief ensues. Recognizing the limited time prior to the finality of death can tailspin one's emotions into shock and grief.<sup>7</sup> Loved ones and friends have often begun cycling through various stages of anticipatory grief even prior to the death of the beloved.<sup>8</sup> As one recognizes the imminence of their death, the individual begins grieving as they prepare spiritually, mentally, and financially for their own death. However, the socially and economically disadvantaged are generally unable to exercise choice over their way of death.<sup>9</sup>

The very culture of death has transitioned throughout recent history. Death has evolved from a process of being surrounded by family members in one's home to a much more bureaucratic and institutionalized process.<sup>10</sup> Family members used to clean and prepare their family member's body for burial followed by very visible signs of mourning.<sup>11</sup> Today most deaths occur in a hospital or nursing home, and the bodies of the

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<sup>6</sup> op. cit. (ref. 3)

<sup>7</sup> DeSpelder & Strickland, 1992

<sup>8</sup> Kübler-Ross, 2006

<sup>9</sup> Phillips, 1994

<sup>10</sup> op. cit. (ref. 7)

<sup>11</sup> Gill, 1996

dead are passed off to another institution prior to burial. The institutionalization of death has removed family and friends from the involvement in the loved one's body past their final breath. The United States has separated the dying from the rest of society and has created a culture in which death is avoided.<sup>12</sup> This culture retreats from the realities of death to move out of despair and into comfort.

In this article, the focus will begin with detailing the history of medical advancements that have had large impacts on end-of-life care. Then, the ways in which the transition of death has revolutionized grief at the end of life will be explored. Grief is an incredibly complex and challenging concept to grasp. It is a process that changes from person to person and is incredibly hard to categorize. For this reason, these changes of bereavement do not encompass all the possible ways in which grief exists or is dealt with. This article simply offers a position on the ways in which some of the advancements in medicine have altered bereavement.

### **History of Medical Advancements: 1940s - Present day**

Although there has been an immense culture shift in the nature of death, there may be other factors that have played a large role into the current understanding of death. Since the 1950s, medical technologies have advanced at an exponential rate, which has altered the very nature of dying. One's vital organs can now be nonfunctioning, yet machines can take the place of organs and medication can alter the chemistry of one's body in such a way that allows the person to continue living. The extension of life through medical technologies has had vast effects. The development of antibiotics, organ transplantation, hospice, palliative care, and other technological advancements has completely altered the way in which we die.

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<sup>12</sup> Root, 1974



### **Antibiotic Development**

Antibiotics is a term that when broken down to its roots means “against life,” meaning against the pathogenic bacterial life. From the 1940s to the 1970s, numerous classes of antibiotics were discovered that jump-started the commercial use of antibiotics.<sup>13</sup> These antibiotics allowed for targeting many infections and pathogenic bacteria. Bacteria, the causative agents for many deaths, were effectively eliminated through medical advancements and research. Through intensive research, antibiotics could offer effective treatments for tuberculosis, bacterial meningitis, strep throat, and many other bacterial diseases.<sup>14</sup> Prior to antibiotics, 90% of children that were diagnosed with bacterial meningitis died.<sup>15</sup> Bacterial diseases, which had previously meant a death sentence, could now be treated through full dosages of antibiotics. Antibiotics completely reconfigured the morbidity and mortality of those with bacterial infections. As new classes of antibiotics were discovered and developed, infections could be managed and life could be extended.

Infections, within industrialized countries, have plummeted resulting in a shift in the leading causes of death to more chronic diseases instigated by the individual’s lifestyle. Generally, the sooner the medication is in the patient’s system, the higher the likelihood of effective treatment.<sup>16</sup> Although infections still kill many individuals throughout the United States each year, the use of antibiotics has cured many from previously deadly diseases has allowed the process of dying to be prolonged.

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<sup>13</sup> Aminov, 2010

<sup>14</sup> American Academy of Pediatrics, 2015

<sup>15</sup> *ibid*

<sup>16</sup> Peleg & Hooper, 2010

**Extraneous Medical Technologies**

It would be impossible to cover each type of medical advancement that has occurred since the 1940s; however, there are a few additional technologies that have become prevalent at the end of life. With these technologies, failure of one's vital organs no longer constitutes death. Through skillful surgical techniques and advanced machinery, biological malfunctions that were once lethal are now successfully repaired.

**Pulmonology.** In the 1940s and 1950s, rows of negative pressure chambers known as iron lungs filled the hospitals due to an upsurge in polio.<sup>17</sup> These chambers enabled children and adults with paralyzed lungs to breathe through negative pressure ventilation. However, in the 1960s the number of iron lungs had begun to decline as smaller ventilators with fewer anticipated risks began to develop.<sup>18</sup> Developers continued to struggle with volume-controlled ventilation, yet in the 1970s a second wave of ICU ventilators were established with patient-triggered inspiration. In the 1980s through the late 1990s, micro-processor driven ventilation began.<sup>19</sup> These machines were much more responsive to the patient's demands than any of the previous ventilators. From the 1990s to the present, there has been a continual growth in the ventilation industry. Most of the current ventilators have a plethora of modes for ventilation and can be adapted to the patient's own needs.<sup>20</sup> As ventilation technology progress, the number of individuals that are supported by such systems at the end of life continues to increase.<sup>21</sup> Many individuals at the end of life cannot wean themselves off of the ventilators. Therefore, the ventilators work in conjunction with their lungs to promote the exchange of gases throughout the

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<sup>17</sup> Kacmarek, 2011

<sup>18</sup> *ibid*

<sup>19</sup> *ibid*

<sup>20</sup> *ibid*

<sup>21</sup> Kahn et al., 2010

body. Ventilation is incredibly crucial to the care of chronic illnesses that have become common throughout the past century. The lungs rely heavily on the functioning of the heart because of this, there have also been exceptional innovations in the field of cardiology.

**Cardiology.** With the ability to extend life ever growing, cardiovascular diseases have become the leading cause of death within the United States.<sup>22</sup> Cardiology is a field that has seen extraordinary growth within recent years. In the early 1900s, various aspects of the heart were beginning to be uncovered, yet the implications of these findings were not fully recognized. Throughout the early 1900s, the number of deaths due heart diseases escalated.<sup>23</sup> In 1948, investigators sought to better understand the cause of these deaths and initiated the Framingham Study, which gave insight into the risk factors for cardiovascular diseases in both men and women.<sup>24</sup> This study linked cholesterol and fatty diets with an increased risk for developing cardiovascular disease. In the mid 1950s, echocardiographs were successfully used to detect the movement of heart walls.<sup>25</sup> With a better understanding of the heart's anatomy and insight into the pathologies of heart disease, physicians in the 1960s performed the first successful coronary artery bypass.<sup>26</sup> This surgery completely revolutionized cardiology and is one of the most common procedures performed today. With an expanding knowledge base of the electrical signals within the heart, arrhythmias became a larger area of research. Electrophysiology gave way to the development of Automatic Implantable Cardiac Defibrillators (AICD) in 1980. Developments such as angioplasty, in 1977, and stents, in 1986, allow for better

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<sup>22</sup> op. cit. (ref. 5)

<sup>23</sup> op. cit. (ref. 5)

<sup>24</sup> Mehta & Kahn, 2002

<sup>25</sup> ibid

<sup>26</sup> ibid

treatment for individuals with cardiovascular diseases today.<sup>27</sup> Recently, the FDA approved the first artificial heart, which replaces the human heart in order to provide an effective treatment for patients with prolonged cardiovascular disease.<sup>28</sup> The potential for vital organs to be replaced with machines has generated much debate within the disciplines of cardiology and nephrology.<sup>29</sup>

**Kidney Dialysis.** In 1943, Dr. Willem Kolff created the first “artificial kidney,” yet it was not until 1945 that the intervention was successful. This structure has been continuously modified and improved upon to provide the most effective care for individuals in renal failure. In the 1950s, the question of indefinite dialysis was posed. In 1962, the first dialysis center was established, but the question of who would receive treatment posed an issue because the demand for dialysis was greater than the supply. In the 1960s, the first chronic hemodialysis treatment began, which lasted for 11 years. The reuse of dialysis machines posed significant issues due to infection with blood borne illnesses. There was a continual search for better dialysis membranes that would allow for the most effective treatment transitioning from cellophane in the 1940s, to cuprophan in the mid 1960s, to cuprammonium cellulose membranes in 1967, and cellulose and synthetic membranes in the 1990s. These continual advancements have made it possible for individuals with renal failure to be placed upon dialysis for extended periods of time. Though this advancement was incredibly effective, the cost of the dialysis creates an ethical dilemma, as many individuals are unable to afford the weekly dialysis procedures. When vital organs are unable to be replaced, organ transplantation serves as the next best option to extend the individual’s life.

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<sup>27</sup> The Society for Cardiovascular Angiography and Interventions, 2009

<sup>28</sup> Lubeck & Bunker, 1982; The U.S. Food and Drug Administration, 2006

<sup>29</sup> Basta & Tauth, 1996; Dousdampanis, Trigka & Fourtounas, 2012

## **Organ Transplantation**

In the 1960s, organ donation and transplantation gained traction, an incredible feat for the medical industry. In 1962-1963, the first successful kidney, liver, and lung transplant recovered from deceased donors was preformed.<sup>30</sup> Within the next ten years, growth continued with the first successful heart, pancreas, and bone marrow transplants.<sup>31</sup> Ten years after the first successful pancreas transplant, in 1976, the immune suppression capabilities of cyclosporines were discovered, which prevented the rejection of the transplanted organs.<sup>32</sup> This had an astonishing effect and allowed for healing and restoration of bodies that had previously been seen as unrecoverable. These immunosuppressive drugs allowed the recipient to have a much longer survival rate than ever before. Diagnoses that had previously been terminal were treated successfully through medical intervention without long-term impacts. Not only were individuals able to get treatment and care for their ailments, but medical professionals were now able to provide a glimpse of hope for their patients whose vital organs were failing. Physicians were then able to take the functioning organs of the deceased and distribute them among patients in need of workable organs.

Within the past years there has been a continual flood of progress as organ transplantation has expanded beyond the thoracic and abdominal organs to include items such as skin transplants as well as the most recent consideration of performing a full human head transplantation.<sup>33</sup> Technology progressed in such a way that the definition of death required new consideration. There has been a lot of controversy with recent

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<sup>30</sup> U.S. Department of Health and Human Services, n.d.

<sup>31</sup> op. cit., ref. 9

<sup>32</sup> op. cit., ref. 9

<sup>33</sup> Hardy, Furr, Barret, & Barker, 2017

technological innovations as to what constitutes death. With the constant shifting of the definition of death, it is possible that grief as an individual experience will also change. Organ transplantation still has limitations given that the number of individuals in need of organ transplantation far exceeds the supply of functional organs; twenty-two people die each day in America waiting for an organ.<sup>34</sup> However, from 1988 to 2017, 683,000 successful organ transplants took place within the United States, and in 2016 alone 33,600 patients had transplants that brought them new life.<sup>35</sup> Transplantation grants life for many who would have previously been denied a second-chance at life. This technology has transitioned the conversation of death in such a way that the death of a loved one is no longer viewed as a process of life, but is rather due to a lack of funds, poor timing, inadequate technology, or a failure of expertise. This view of death as a lack of resources has made death into an abnormality. To better care for individuals experiencing these view of death, the hospice industry began providing end-of-life care to both the patient and the caregivers.

### **Hospice and Palliative Care**

In the 1970s, Florence Wald's lectures at Yale on holistic end-of-life care jumpstarted the growth of the hospice movement.<sup>36</sup> The idea gained its footings with the publication of Kübler-Ross' book titled *On Death and Dying*.<sup>37</sup> As people began to recognize the power that we had to extend life, the need for hospice became ever greater. In response to an ever-aging population coupled with protracted periods of illness, the need for end-of-life care became more prevalent. In 1974, the first hospice program was

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<sup>34</sup> Donate Life America, 2017

<sup>35</sup> *ibid*

<sup>36</sup> National Hospice and Palliative Care Organization, 2016

<sup>37</sup> Kübler-Ross, 1969

started, and today there are over 6,100 programs dedicated to end-of-life care.<sup>38</sup> Hospice provides end-of-life care to terminally ill patients with a prognosis of six months or less to live. During this time the hospice team offers palliative care (“comfort care”), expert medical care, emotional support, and spiritual support based upon the patient’s desires. The hospice mission is not directed at eradicating illness but rather is targeted at caring for the patients and the families of patients. According to the Gallup poll, 88% of the American population would prefer to die at home, pain free, and surrounded by family members.<sup>39</sup> The hospice mission seeks to accomplish each of these three goals by providing comfort care to patients within their home.<sup>40</sup> The hospice network provides care for an estimated 1.6-1.7 million people within the United States each year, and that number continually growing.<sup>41</sup>

With the development of end-of-life care, there has been a greater emphasis placed on providing support for individuals as they enter the last stages of life. This support extends to family members as they grieve the death of their loved ones. This form of care has dramatically changed the way in which Americans can die. Although there has been positive progression towards the patient’s preferred location of death, it seems that this progression has been based upon one’s social position and level of resources rather than their intrinsic desires.<sup>42</sup> The societal elite are the individuals that reap most of the hospice benefits, whereas a majority of the poor do not have the support or understanding of end-of-life care. The hospice movement as a whole has provided an option of comfort and emotional care that had previously been neglected. Hospice and

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<sup>38</sup> NHPCO’s Facts and Figures, 2015

<sup>39</sup> *ibid*

<sup>40</sup> *ibid*

<sup>41</sup> *ibid*

<sup>42</sup> Grunier et al., 2007

palliative care offer a helpful consideration for the way in which one dies and seek to aid the patient and the family as they enter the end of life.

Since the 1940s, medical advancements have become increasingly effective and have given healthcare teams the capability to extend life. With the current advancements, physiologically inept organs can be replaced with organ transplantation; antibiotics aid the transition to chronic diseases as the primary cause of death; hospice and palliative care has redefined the way that people die; and biologically malfunctioning organs that would previously have been lethal can now be replaced with help of technological advancements. Though the technologies may seem like a “godsend” for some, others view these technologies as a curse that extends the painful process of dying.<sup>43</sup> Death has become so segregated from life that the way in which one approaches death has been fundamentally altered.

### **Grieving Death**

With the continual advancements in each of these medical technologies, the way in which the American society grieves death has been fundamentally altered. The chronology of medical advancements will now be applied to the impacts that they have had on the grieving process. Although grief is incredibly challenging to define, Kübler-Ross defines grief in stages including denial, anger, bargaining, depression, and acceptance.<sup>44</sup> These five stages are neither chronological nor exhaustive; however, they provide a framework for the conversations on grief at the end of life.

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<sup>43</sup> op. cit. (ref. 7)

<sup>44</sup> op. cit. (ref. 37)



**Antibiotic Development**

From the 1940s to the 1970s, many of the classes of antibiotics were developed. During this time, there was a rather swift movement away from infectious diseases as a major cause of death towards chronic illness as the major cause of death. The transition to chronic illness as the main cause of death results in great weight being placed on the patient's daily decisions of health. As "self-induced" illnesses became more prevalent, the blame for death was placed upon the patient rather than the pathogenic agent. As an individual is diagnosed with a chronic illness, they may experience high-grief because they feel personally responsible for the disease.

With the invention of antibiotics, the average age of death increased because children were able to survive infection. Before this development, children, who have weaker immune systems than adults, were more susceptible to death from pathogenic bacteria. Grief has shifted to account for the age of death increasing as people are grieving the death of the elderly more often than the death of children.<sup>45</sup> Grief tends to be more severe for a young child as their life seems to be "cut short."<sup>46</sup> Since the antibiotics allow for the life of a child to be extended, the death of a child within the current American culture is shocking and is perceived as unjust rather than commonplace.

In addition to grief being escalated due to perceived injustice of death, the death process has been prolonged resulting in a reaction known as anticipatory grief. As chronic illnesses have an extended timeline, the survivors begin to grieve the death of the loved prior to the death.<sup>47</sup> Survivors may cycle through all the stages of grief prior to the

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<sup>45</sup> op. cit. (ref. 5)

<sup>46</sup> op. cit. (ref. 7)

<sup>47</sup> Lindemann, 1944

loved one's departure.<sup>48</sup> Anticipatory grief seems to have different effects on different individuals. For some, as they cycle through stages of grief prior to the death of a loved one, they are able to feel peace as their beloved departs. However, for others the anticipatory grief does not alleviate the post-mortem grief and instead adds an additional layer of grief to the survivor's grieving process.<sup>49</sup> Prior to antibiotics, an infection would take the life of an individual rather quickly; therefore anticipatory grief was not an option.

In addition to the antibiotics prolonging the process of death, death has become hidden due to a number of factors. The shift towards the death of the elderly, due to antibiotics, has made death invisible, as these older individuals are less socially involved. As death has been hidden, a culture's ability to understand grief has diminished resulting in grief characterized by a lack of social support, also known as disenfranchised grief.<sup>50</sup> Without a support network, the grief tends to be prolonged and pathogenic. The extended time frame of grieving without a support network likely results in a grief of escalated severity. It is evident that antibiotics have played a large role in the process of grief. Antibiotics have changed the grieving process by shifting the blame of death towards the patient, altering the average age for death resulting in an introduction of anticipatory grief, and by closing individuals out of a support network.

### **Extraneous Medical Technologies**

From the 1940s until today, the disciplines of Pulmonology, Cardiology and Nephrology have made immense progress. From the invention of dialysis, to the development of the coronary bypass technique, and from the iron lung to modern day

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<sup>48</sup> Holley & Mast, 2009

<sup>49</sup> op. cit. (ref. 7)

<sup>50</sup> Gill & Lowes, 2013

respirators, these disciplines have redefined what it means to die. Death can now be thwarted through surgeries and machinery. Although each field has discrete impacts on grief, they are each following similar trends. With these techniques, loved ones grieve for an extended period of time as death continues to be pushed further away. As one grieves the death of a loved one, blame for the death is shifted towards a lack of resources. Death is no longer viewed as a customary process of life, but instead death is blamed on not having enough time, expertise, or monetary funds. The caretaker's grief is complicated as they are left wondering if the life of their loved one could have been extended further.

**Pulmonology.** The advancements in the pulmonology field are vast, however the most obvious transformation has been the development of mechanical respirators. Modern day respirators simply cover the face, as opposed to the iron lung, which covered the entire body. Despite the incredible advancements, there is still the issue of respiratory dependency that was seen with the iron lung.<sup>51</sup> When patients are placed on ventilator support, their respiratory muscles tend to lose their strength, as they are not able to fully breathe for themselves.<sup>52</sup> The use of a ventilator creates an additional barrier for family members, as they must also choose when to stop the ventilation process. The family may feel personally responsible for the death of their loved one and therefore their grieving process is exacerbated. It is evident that the additional choices involved in withdrawing support or placing the patient on support has a much more negative affect on a caretaker's ability to cope with death because they feel that their choice is more involved.<sup>53</sup> The change in the pulmonary equipment matched with the change in the

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<sup>51</sup> Barr, 2010

<sup>52</sup> Sauthier, Michaël; Rose & Louise, 2017

<sup>53</sup> Munson, 2007

American culture to postpone death, has created an increased resistance to ending life, thereby increasing the caregivers bereavement following their loved one's death.

In addition to the loved one's death increasing, the patient's own grief may increase as health choice tend to escalate the occurrence of respiratory ailments, most commonly COPD.<sup>54</sup> If a patient has smoked for an extended period of time, the blame for the illness will be placed upon the patient, which will generally result in more severe grief for the patient. An individual with COPD differs from a terminally ill patient given that the illness can extend for a greater period of time. The extended period of time allows for greater anticipatory grief of the loved ones and a longer reflection upon death and continual seasons of loss.<sup>55</sup> With the advancements in pulmonary technology, the period for illness has been extended thereby prolonging the period of progressive loss resulting in an extended season for grief.

**Cardiology.** Similar to the changes seen in pulmonology, the current model for cardiology has a stronger emphasis on the patient's daily health decisions. Given the known link between coronary artery disease and obesity patients with high fat diets are likely to be blamed for their own death.<sup>56</sup> Contrary to pulmonology, advancements in cardiology tend to involve more surgical techniques rather than extracorporeal machinery. Cardiovascular surgery, especially within older populations, tends to place less of a strain on caregivers, as they do not hold the guilt for the end-of-life decisions.

The recent invention of the artificial heart has generated further discussion on the ability to prolong life even further through replacement of a human heart with a piece of machinery. For many individuals that have had successful heart transplants, they tend to

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<sup>54</sup> Boer et. al., 2013

<sup>55</sup> *ibid*

<sup>56</sup> Centers for Disease Control and Prevention, 2015

have a hard time adjusting out of the “sick-role” that their lives had previously revolved around. This, in turn, results in high grief and disillusionment for the patient. This technology, though effective, has had major implications on the transition of previously sick individuals back into “healthy” society. The adjustment into society after treatment has also had large impacts on an individual on dialysis treatment.

**Kidney Dialysis.** Dialysis treatments are one of the most time consuming of all medical technologies.<sup>57</sup> Although there have been immense advancements, the strain that it places on a patient’s daily life has had immense impacts on the patient’s grieving process. If prolonged dialysis is the only treatment left, some patients choose to refuse treatment and accept death. The amount of time that one must dedicate to ensure correct filtration often completely alters the framework of one’s daily activities. Patients experience immense amounts of grief, as they feel deeply disconnected with loved ones and they approach death.

Many times the caregivers also experience immense “quasi-widowhood” as their loved one’s life is radically altered.<sup>58</sup> The caregivers may view the dying individual as already dead to them given that they are uninvolved and debilitated. This brings about high levels anticipatory grief as the caregiver grieves the perceived loss of their loved one’s life.

### **Organ Transplantation**

With the development of immunosuppressive drugs, organ transplantation shifted from a trial and error procedure, to an effective treatment method for organ diseases.

With a successful transplantation, both the patient and family members tend to be

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<sup>57</sup> Russ, Shim & Kaufan, 2008

<sup>58</sup> op. cit. (ref. 46)

incredibly grateful. Successful transplantation is known to extend the life of loved ones, at times more than twenty years. The physician that performs the organ transplantation generally views the procedure as a deeply gratifying experience as well because they are able to “give life” to many whose lives would have otherwise been cut short. The immediate emotional responses from organ transplantation are incredibly positive, yet the implications for the grieving process fluctuate between beneficial and toxic. When one is waiting for an organ transplant, the family, friends, and patient are left in limbo, longing for a renewed body. There is anticipation and hope that the transplantation will be both available and effective. Despite advancements and the ability to use immunosuppressive drugs, organ rejection still occurs across the United States. When a patient’s body rejects the donated organ, the caretakers and the patient grieve, as a sense of hope is lost.<sup>59</sup> Many healthcare professionals and family and friends are not always able to fully comprehend the psychosocial impact of organ rejection on the patient. Due to the lack of understanding, the patient is likely to experience disenfranchised grief.<sup>60</sup> Organ transplantation grants patients and caregivers hope for a renewed future. However, when that sense of hope is lost due to organ rejection, the loved ones begin anticipating the loss of their resulting in anticipatory grief. Prior to organ transplantation, there was no potential for the false sense of hope that many of the patients and family members endure.

Organ transplantation has allowed biological malfunctions to be successfully treated, which again leads to the extension of life. Organ donation creates an interesting paradox of both extreme joy and extreme grief. When a patient dies waiting for an organ

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<sup>59</sup> *ibid*

<sup>60</sup> *ibid*

donation, the grief level that a family endures is high given that their loved one could have been saved. The death of a loved one is blamed upon not having enough expertise, time, or resources, rather than accepting death as a reality of life. On the contrary, a donor's family is given hope as the death of their loved one has the potential to sustain the life of another in need. The knowledge of their loved one's organs being used to sustain another's life provides both family and friends with a hope that the death of their loved one was beneficial to another's life.<sup>61</sup> As death is encountered, organ transplantation can either complicate or alleviate the grief that a loved one endures. Prior to organ transplantation, there was no possibility that a dead body's organ would reap benefits to another's life. Now the death of a loved one has the potential to bring life through organ transplantation. Organ transplantation has changed the grieving process by introducing both positive and negative changes. Organ rejection brings added grief to the death of a loved one, and organ transplantation brings hope for new life because of the death of a loved one.

### **Hospice and Palliative Care**

End-of-life care has gained traction as the process of dying has been extended. The hospice movement shifts the focus from curing the patient to caring for the patient. The fields of hospice and palliative care took roots when individuals began examining the process of dying from the patient's perspective. Palliative care, also known as comfort care, manages the pain of the patient and has had large effects on the grief that a loved one endures. When a loved one can no longer be cured, the caregiver begins anticipating the death of their beloved.<sup>62</sup> During this time, individuals begin experiencing

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<sup>61</sup> Walker & Sque, 2015

<sup>62</sup> Lobb, Clayton & Price, 2006

high levels of distress given that there is nothing else that anyone can do to save their loved one.<sup>63</sup> However, when hospice care becomes available to these individuals, the amount of major depression seems to be reduced.<sup>64</sup> This lessening of grief is likely due to the care and consideration that the patient has during their final moments and based on bereavement counseling that is offered to the caregiver. Caretakers are given thirteen months of bereavement counseling after the death of their loved-one to help the survivors cope with their loss.<sup>65</sup> With the hospice movement, family members are more at peace about the way in which their loved ones have died given that the pain level was managed and knowing that their loved one had the best death possible provides comfort to families that had previously been missing.<sup>66</sup>

In addition to bereavement care, hospice also seeks to move the place of death back into the home. The hospice movement seeks to align more closely with desires for death. This deinstitutionalization of death aligns more with the patient's desires to die at home, surrounded by loved ones.<sup>67</sup> The movement back into the home places the family at the center of the dying processes. The central role of family members in the end-of-life care allows for the better acceptance of a loved ones death. Hospice has changed the grieving process by placing an emphasis on the emotional care of the caregiver and the physical care of the patient. Hospice has given authority to both the patient and the caregiver as they decide on the last stages of life. Without hospice, the grief of terminal illnesses would be hidden and the end-of-life care would not be as peaceful. Grief at the

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<sup>63</sup> *ibid*

<sup>64</sup> Orstein et. al., 2015

<sup>65</sup> Vogel, 2011

<sup>66</sup> *op. cit.* (ref. 53)

<sup>67</sup> Dunlop, Davies & Hockley, 1989



end of life would likely be more severe without the bereavement support and the management of pain at the end of life.

### **All Technologies**

The impact on grief due to medical advancements has been quite profound. Each of the technologies listed above have protracted the process of dying. This prolonged process has allowed for anticipatory grief to emerge as families begin anticipating the death of their loved one.<sup>68</sup> Acute grief, grief following the death of a loved one, still exists, however there has been a large shift in grief towards the anticipatory grief, grief prior to the death of a loved one. Even if grief is not reduced by the anticipation of death, the chronic illnesses tend to result in much less shock upon death. As families begin cycling through the stages of grief prior to a loved one's death, the death no longer stands as the starting point of the grief cycle. Rather, death may be a relief for the loved ones, as they no longer have to observe the prolonged dying process. With the addition of technologies there are also additional choices placed upon the patients as they must choose both if and when to start treatment and when the treatment should stop.

As one stands as a survivor within the world, grief tends to be a driving force for the way in which one approaches death. For many, the very idea of grief is both cumbersome and exhausting. Many wish to divert their attention away from grief and towards matters that are more "uplifting." Although expressed in a variety of ways, grief stands as one of the few universal human experiences. Within the United States, death is broadcast across the news and media, which generates a culture that is desensitized to the realities of death. Death approaches the desensitized American minds and broadsides them with the pain and suffering as their own loved one dies. When one witnesses the last

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<sup>68</sup> op. cit. (ref. 44)

breath of a loved one, it is the rattling lungs and the blue, flaccid skin that bear the marks of death. Although the stories of death are observed daily, the disillusionment with death fades when ones beloved is the patient on the hospital bed.

### **Methodology**

To gain a better understanding of the impact that medical advancements have on the process of grief, healthcare professional from a variety of disciplines were interviewed. Prior to the interview, the health care professional signed a consent form to ensure the responses were kept confidential. The healthcare providers varied in age, race, gender, and specialization; however, all of the providers practice within the United States. The sample consisted of two ICU nurses, one pediatrician, two hospice nurses, one pediatric cardiologist, one pediatric hematologist oncologist, and one hospice bereavement coordinator. Ideally, the healthcare provider would have had many years of practice in order to better reflect on the ways in which they had seen technology change throughout their time in the medical field. Eight healthcare providers were recruited through email or by phone. The healthcare providers were questioned about the changes that they had observed in medical technologies throughout their years of practice. Additionally, the providers were asked about the observations they had seen in both the patient and the caregiver's grief. The providers were then questioned on if they saw a correlation between the two.

The interviews ranged from fifteen minutes to an hour, depending on the provider's interest and experiences. The researcher had a set list of questions to guide the conversation; however, the practitioner's departures from the exact questions, such as

experiences and stories were not dismissed. For further details of the questions, please visit Appendix A.

A limitation with this research is the location of employment, as seven out of the eight interviewees practiced in Texas. Although similar trends may be evident in other developed countries, the results are not generalizable as the healthcare systems vary greatly between countries. The research focuses on the ways in which medical technologies impacted the American vision of grief.

## **Results**

**Impact on Death.** Although each healthcare professional had their own unique experiences, there were various trends in each of the responses. Each of the respondents indicated an impact of technologies on physician-patient interactions. The general theme was that the advancements in medical technologies have removed some of the human components of medicine. Each professional described a technological world in which the physician's interaction with the patients were masked by technological advancements. These technologies are necessary to maintain the current healthcare standards, but if the practitioner is not intentional about connecting with the patient, the technology can inhibit relationships between the patient and the physician. These relationships become vital for end-of-life care, as the physician plays a crucial role in both the caregiver's and the patient's grieving process. Throughout the interviews it was evident that each practitioner plays a crucial role in reassuring and comforting both the patient and the caregiver. If the practitioner remains disengaged, the grief that the patient and caregiver endure will likely be amplified.

The practitioner, regardless of field, indicated an exponential growth in the advancement of medical technologies. Each of the technologies that were described lead

to either a better understanding of the anatomy of various organs or lead to improved end-of-life care. With the end-of-life care improving, the line for viability with stretched in both directions, to include both elderly and neonates. The providers indicated a greater emphasis on extending life than on the quality of the life that was being prolonged. All the practitioners saw both positive and negative aspects to this extension of life.

When a health care provider argued the positive aspect of the technological advancements, they seemed to indicate that the technologies allowed for loved one to have a better chance to say goodbye. This goodbye was crucial to one's initial grieving process as this gesture indicated an acceptance of the death and allowed the caregivers to be more at peace about the death. The technologies also allowed family and friends to claim that they did everything possible to preserve the life of their loved one. This is especially crucial for end-of-life care for pediatric patients as the caregiver wishes to further extend the short life of their loved one. Family and friends tend to take comfort in the fact that the technologies were exhausted and nothing more could have been done to preserve the life. The most obvious of the positive effects is that the technological innovations did save the lives of many. Both children and adults that had previously been deemed unviable were given a second chance at life. This had the most profound impact on the patient and caregiver's view of the technological innovations. The option for death to be postponed gave families a deep appreciation for the advancements yet also had some negative consequences.

As a family member approaches the death of their loved one, they are at a highly compromised state. Many family members will follow the doctor's suggestions and push for all the life-sustaining care possible. The main critique that the healthcare

professionals stated is that many families don't know when they have done enough. After the death many times the caregivers will think back and wish that they had done something differently to further extend their loved one's life. At times, the technologies extend the dying process creating more suffering and pain for the patient. This extension of life has created such a resistance to death that even when the patient is ready for their life to end; the family pushes back and asks for further treatment. This escalates the grieving process for the caregiver, as they feel a great sense of responsibility for their loved one's death.

**Impact on Grief.** It was quite evident from the various healthcare professionals that the advancements in medical technologies have altered the grieving process for both the patient and the caregiver. It was also evident that each individual grieves in very different ways. A death that may cause one individual to fall into denial may lead another individual to acceptance. The major impact of medical advancements has been the extension of the dying process. In line with the literature, the healthcare professionals indicated a shift in the grief cycle towards anticipatory grief. However, acute grief, or grief following the death of a loved one, is still very much a part of the grieving cycle throughout the United States. Sudden death and short-term illnesses still result in death across the United States; however, many changes have occurred in grief due to the extension of the dying process.

In addition to the shift towards a prolonged death, the bereavement process has also become hidden. Many of the healthcare providers indicated grief tends to be more individualistic and private. This hidden bereavement has made the adjustment after significant loss much more difficult for the survivors as they are left without support.

This process has lead to disenfranchised grief in which the social support after death seems to be lacking. Each of the hospice and ICU staff members indicated that the hospice program has been influential in their ability to remedy the difficulty. The support system that the program provides lessens the burden of the grieving process as it provides a community of care for the dying member and those that the deceased are survived by.

It was also evident that prolonging death had a large impact on the ways in which the patient grieves death. With the extension of the dying the patient is now able to grieve his or her own mortality. Anticipatory grief has been extended to the patients as they begin cycling through various stages of grief prior to their own death. Prior to the medical advancements addressed above, the death had been more sudden and did not give the patients time for fully reflect on what it means to die. This has change the very conversation of grief to include both the caregiver and the patient.

Although out of the scope of my project, it is evident that the grieving process is affected external factors such as religion, race and age. Many healthcare providers alluded to the fact that religiosity may increase the grief that an individual endures, although literature tells both side of the same coin.

## **Conclusion**

It is evident that the bereavement process is incredibly complex and multifaceted. There is still much to learn as each individual grieves in different ways. It is evident that the medical technologies, especially those involved at the end of life, play an influential role on the way in which one grieves death. Currently, the cycle of grief has shifted from a post-mortem grief to a pre-mortem grief. Post-mortem grief still exists, however a majority of deaths in the United States occur in the elderly population from chronic

illnesses, therefore the prevalence of pre-mortem grief has risen. Through the invention of medical technologies, anticipatory grief has extended to both the patient and the caregiver. This has had major impacts on the way the patient approaches the end of life.

Still more research is needed to better understand the scope of these advancements. Medical practitioners need to be aware that the advancements and technologies that they place upon their loved ones effect more than the patients physical health. With this understanding, practitioners will be able to better understand the way in which their actions impact both their patient and the caregivers surrounding them.

## References

- Ahlström G. (2007). Experiences of loss and chronic sorrow in persons with severe chronic illness. *Journal of Nursing & Healthcare of Chronic Illnesses*, 16(1), 76–83.
- American Academy of Pediatrics. (2015, November 21). *The History of Antibiotics*. Retrieved from <http://www.healthychildren.org/English/health-issues/conditions/treatments/Pages/The-History-of-Antibiotics.aspx>
- Aminov, R. I. (2010). A brief history of the antibiotic era: Lessons learned and challenges for the future. *Frontiers in Microbiology*, 1. <https://doi.org/10.3389/fmicb.2010.00134>
- Anand-Kumar, V., Kung, M., Painter, L., & Broadbent, E. (2014). Impact of organ transplantation in heart, lung and liver recipients: Assessment of positive life changes. *Psychology & Health*, 29(6), 687–697. <https://doi.org/10.1080/08870446.2014.882922>
- Aries, P. (1981). *The Hour of Our Death*. Trans. H. Weaver. New York: Knopf.
- Barr, M. (2010). The iron lung: A polio patient's story. *Journal of the Royal Society of Medicine*, 103(6), 256–259. <https://doi.org/10.1258/jrsm.2010.100003>
- Basta, L., & Tauth, J. (1996). High technology near the end of life: setting limits. *Journal of the American College of Cardiology*, 28(6), 1623–1630.
- Bednar, B., & Latham, C. (2014). The changing landscape of the nephrology nursing care environment in the United States over the last 45 years. *Nephrology Nursing Journal*, 41(2), 183–199.
- Blauner, R. (1992). Death and social structure. *Illness, Crisis & Loss*, 2(2), 22–32. <https://doi.org/10.2190/IL2.2.d>
- Boer, L. M., Daudey, L., Peters, J. B., Molema, J., Prins, J. B., & Vercoulen, J. H. (2014). Assessing the stages of the grieving process in chronic obstructive pulmonary disease



(COPD): Validation of the acceptance of disease and impairments questionnaire (ADIQ). *International Journal of Behavioral Medicine*, 21(3), 561–570.

<https://doi.org/10.1007/s12529-013-9312-3>

Buckley, W. J., Sulmasy, D. P., Mackler, A., & Sachedina, A. (2012). Ethics of palliative sedation and medical disasters: Four traditions advance public consensus on three issues. *Ethics & Medicine: An International Journal of Bioethics*, 28(1), 35–63.

Carr, D. (2012). Death and dying in the contemporary United States: What are the psychological implications of anticipated death? *Social and Personality Psychology Compass*, 6(2), 184–195. <https://doi.org/10.1111/j.1751-9004.2011.00416.x>

Center for Disease Control and Prevention. (2013, March) Trends in inpatient hospital deaths: National hospital discharge survey, 2000-2010. (NCHS Data Brief No. 118)  
Retrieved from <https://www.cdc.gov/nchs/products/databriefs/db118.htm>

Coronary Artery Disease: Causes, Diagnosis & Prevention. cdc.gov. (n.d). Retrieved April 13, 2017, from [https://www.cdc.gov/heartdisease/coronary\\_ad.htm](https://www.cdc.gov/heartdisease/coronary_ad.htm)

DeSpelder, L. A., & Strickland, A. L. (1987). *The last dance : encountering death and dying*. Palo Alto, Calif. : Mayfield Pub. Co.,1987.

Dousdampanis, P., Trigka, K., & Fourtounas, C. (2012). Diagnosis and management of chronic kidney disease in the elderly: A field of ongoing debate. *Aging & Disease*, 3(5), 360–372.

Duke S. (1998). An exploration of anticipatory grief: the lived experience of people during their spouses' terminal illness and in bereavement. *Journal of Advanced Nursing*, 28(4), 829–839. <https://doi.org/10.1046/j.1365-2648.1998.00742.x>

- Dunlop, R. J., Davies, R. J., & Hockley, J. M. (1989). Preferred versus actual place of death: a hospital palliative care support team experience. *Palliative Medicine*, 3(3), 197–201.  
<https://doi.org/10.1177/026921638900300305>
- FastStats. (n.d.). Retrieved March 28, 2017, from <https://www.cdc.gov/nchs/fastats/leading-causes-of-death.htm>
- FDA approves first totally implanted permanent artificial heart for humanitarian uses. (n.d.). Retrieved April 13, 2017, from <https://www.sciencedaily.com/releases/2006/09/060905144336.htm>
- Federal Interagency Forum on Aging-Related Statistics. (2016). *Older Americans key indicators of well-being*. Hyattsville, MD.
- Fins JJ. (1999). Death and dying in the 1990s: intimations of reality and immortality. *Generations*, 23(1), 81–86.
- Gill, P., & Lowes, L. (2014). Renal transplant failure and disenfranchised grief: participants' experiences in the first year post-graft failure--a qualitative longitudinal study. *International Journal of Nursing Studies*, 51(9), 1271–1280.  
<https://doi.org/10.1016/j.ijnurstu.2014.01.012>
- Gill, R. T. (1996). Whatever happened to the American way of death? *Public Interest*, (123), 105–117.
- Gruneir A, Mor V, Weitzen S, Truchil R, Teno J, & Roy J. (2007). Where people die: A multilevel approach to understanding influences on site of death in America. *Medical Care Research & Review*, 64(4), 351–378.

- Hardy, M. A., Furr, A., Barret, J. P., & Barker, J. H. (n.d.). The immunologic considerations in human head transplantation. *International Journal of Surgery*.  
<https://doi.org/10.1016/j.ijss.2017.01.084>
- Harris, D. (2010). Oppression of the bereaved: A critical analysis of grief in western society. *OMEGA- Journal of Death and Dying*, 60(3), 241–253.  
<https://doi.org/10.2190/OM.60.3.c>
- History of Hospice Care. (n.d.). Retrieved March 31, 2017, from  
<https://www.nhpco.org/history-hospice-care>
- History of Organ Donation and Transplants. (n.d.). [html]. Retrieved March 27, 2017, from  
<https://www.organdonor.gov/about/facts-terms/history.html>
- Holley, C. K., & Mast, B. T. (2009). The impact of anticipatory grief on caregiver burden in dementia caregivers. *The Gerontologist*, 49(3), 388–396.  
<https://doi.org/10.1093/geront/gnp061>
- Kacmarek, R. M. (2011). The mechanical ventilator: past, present, and future. *Respiratory Care*, 56(8), 1170–1180. <https://doi.org/10.4187/respcare.01420>
- Kahn, J. M., Benson, N. M., Appleby, D., Carson, S. S., & Iwashyna, T. J. (2010). Long-term acute care hospital utilization after critical illness. *JAMA*, 303(22), 2253–2259.  
<https://doi.org/10.1001/jama.2010.761>
- Kochanek, K.D., Murphy, S.L. Jiaquan Xu, & Tejada-Vera B. (2016, June 30). *National vital statistics support*. Retrieved from  
[https://www.cdc.gov/nchs/data/nvsr/nvsr65/nvsr65\\_04.pdf](https://www.cdc.gov/nchs/data/nvsr/nvsr65/nvsr65_04.pdf)
- Kübler-Ross, E. (2003). *On death and dying : what the dying have to teach doctors, nurses, clergy, and their own families*. New York : Scribner, 2003.

- Kübler-Ross, E., & Kessler, D. (2006). *On grief and grieving: finding the meaning of grief through the five stages of loss*. Waterville, Me. : Thorndike Press, 2006.
- Lewis, C. S. (2001). *A grief observed*. [San Francisco] : HarperSanFrancisco, 2001.
- Lindemann, E. (1944). Symptomatology and management of acute grief. *American Journal of Psychiatry*. 151, 155–160.
- Lobb, E., Clayton, J., & Price, M. (2016). Suffering, loss and grief in palliative care, 35(10), 772–775.
- Lubeck, D., & Bunker, J. (1982). *The artificial heart : cost, risk, and benefits*. DIANE Publishing.
- Mehta, N. J., & Khan, I. A. (2002). Cardiology's 10 Greatest Discoveries of the 20th Century. *Texas Heart Institute Journal*, 29(3), 164–171.
- Mitford, J. (1963). *The American Way of Death*. New York: Simon and Schuster.
- Munson, D. (2007). Withdrawal of mechanical ventilation in pediatric and neonatal intensive care units. *Pediatric Clinics of North America*, 54(5), 773–785.  
<https://doi.org/10.1016/j.pcl.2007.08.001>
- National Hospice and Palliative Care Organization. (2015). *NHPOC's facts and figures: Hospice care in America*. Virginia, Alexandria.
- Olshansky, S. J., & Ault, A. B. (1986). The fourth stage of the epidemiologic transition: The age of delayed degenerative diseases. *The Milbank Quarterly*, 64(3), 355–391.  
<https://doi.org/10.2307/3350025>
- Organ Donation Statistics. (n.d.). Retrieved from <https://www.donatelife.net/statistics/>
- Ornstein, K. A., Aldridge, M. D., Garrido, M. M., Gorges, R., Meier, D. E., & Kelley, A. S. (2015). Association between hospice use and depressive symptoms in surviving spouses.

*JAMA Internal Medicine*, 175(7), 1138–1146.

<https://doi.org/10.1001/jamainternmed.2015.1722>

Peleg, A. Y., & Hooper, D. C. (2010). Hospital-acquired infections due to gram-negative bacteria. *The New England Journal of Medicine*, 362(19), 1804–1813.

<https://doi.org/10.1056/NEJMra0904124>

Philip, A. G. S. (2005). The evolution of neonatology. *Pediatric Research*, 58(4), 799–815.

<https://doi.org/10.1203/01.PDR.0000151693.46655.66>

Phillips, D. R. (1994). Epidemiological transition: Implications for health and health Care provision. *Geografiska Annaler. Series B, Human Geography*, 76(2), 71–89.

<https://doi.org/10.2307/490591>

Root, A. (2010). *The promise of despair : the way of the Cross as the way of the church*.

Nashville, TN : Abingdon Press, c2010.

Ross, M. M., Rosenthal, C. J., & Dawson, P. G. (1993). Spousal caregiving following institutionalization: the experience of elderly wives. *Journal of Advanced Nursing*,

18(10), 1531–1539. <https://doi.org/10.1046/j.1365-2648.1993.18101531.x>

Russ, A. J., Shim, J. K., & Kaufman, S. R. (2005). “Is there life on dialysis?”: Time and aging in a clinically sustained existence. *Medical Anthropology*, 24(4), 297–324.

<https://doi.org/10.1080/01459740500330639>

Sauthier, M., & Rose, L. (2017). Pediatric prolonged mechanical ventilation: Considerations for definitional criteria. *Respiratory Care*, 62(1), 49–53.

<https://doi.org/10.4187/respcare.04881>

*Statistics of the United States, (including Mortality, Property, & C.) in 1860*. (1866). U.S. Government Printing Office.

- The Society for Cardiovascular Angiography and Interventions. *Timeline: 30 years of progress in interventional cardiology*. (n.d.). Retrieved from <http://www.scai.org/Press/detail.aspx?cid=7a2d5630-689b-4717-94e5-2c2b911a29e7#.WPQ3dxIrKgQ>
- Thirsk, L. M., & Moules, N. J. (2013). I can just be me: Advanced practice nursing with families experiencing grief. *Journal of Family Nursing*, 19(1), 74–98. <https://doi.org/10.1177/1074840712471445>
- Timmermans, S. (1999). When death isn't dead: Implicit social rationing during resuscitative Efforts. *Sociological Inquiry*, 69(1), 51–75.
- U.S. Department of Health and Human Services. (n.d.). *Timeline of historical events and significant milestones*. Washington, D.C.
- Vogel, S. L. (2011). What physicians should know about hospice. *The Ochsner Journal*, 11(4), 353–356.
- Walker, W., & Sque, M. (2016). Balancing hope and despair at the end of life: The contribution of organ and tissue donation. *Journal of Critical Care*, 32, 73–78. <https://doi.org/10.1016/j.jcrc.2015.11.026>
- White, C., & McDonnell, H. (2014). Psychosocial distress in patients with end-stage kidney disease. *Journal of Renal Care*, 40(1), 74–81. <https://doi.org/10.1111/jorc.12054>
- Winograd, R. (2012). The balance between providing support, prolonging suffering, and promoting death: Ethical issues surrounding psychological treatment of a terminally ill client. *Ethics & Behavior*, 22(1), 44–59. <https://doi.org/10.1080/10508422.2012.638825>

**Appendix A**  
**A Chronological Analysis on the Ways in Which Advancements in Medical**  
**Technologies have Altered the Grieving Process**  
**Interview Questions**

**1a.** How long have you been practicing medicine?

**1b.** How long have you been in the medical field?

**2.** Thinking back to the beginning of your medical career, until now, how would you say that you have seen technologies in the medical field change?

**3a.** My hypothesis is that advancements in medical technologies have altered the process of grief that an individual endures when they or a loved one is dying. Have you seen a change in the way individuals grieve the loss of life in the medical field?

**3b.** Do you think medical technologies have anything to do with the changes in grief that these individuals are enduring, and if so, how?